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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TRUONG, LECHI

ART UNIT	PAPER NUMBER
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2126

DATE MAILED: 03/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/896,206

Applicant(s)

CIERNIAK, MICHAL

Examiner

LeChi Truong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

DETAILED ACTION

1. Claims 1-16 are presented for the examination

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 7, 8, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al (US. Patent 5,754,862) in view of Jordan (US. Patent 6,016,392) and further in view of Boujarwah (Testing syntax and semantic coverage of Java language compilers).

3. As to claim 1, Jones teaches the invention substantially as claimed including: a class (the class, col 5, ln 15-53/col 7, ln 1-25/col 12, ln 35-67), implement (implement, col 5, ln 44-67), a function (the function members 603,604,605,607, col 12, ln 35-67/ Fig. 6), an vtable (virtual function table, col 5, ln 15-53/col 7, ln 1-25/col 12, ln 35-67/ Fig. 6), a first pointer (B1:fa11 603,

col 12, ln 35-67/ Fig. 6), an object (the data structure 601, col 5, ln 15-53/col 7, ln 1-25/col 12, ln 35-67/ Fig. 6), an instance of the class(instance of class, col 5, ln 43-59), second pointer(vfptr pointer, col 7, ln 1-4/A1::vfptr, col 11, ln 50-67/ col 12, ln 35-67, Fig. 6).

4. Jones does not explicit teach the term “ interface” and vtable as interface vtable, the second pointer of an object configured to point to the interface vtable associated with the interface. However, Jordan teaches “ interface” and vtable as interface vtable (interface, an interface ID with the Vtable 416, col 3, ln 33-67/ Fig. 4), the second pointer of an object configured to point to the interface vtable associated with the interface (an Interface list 314 specifics the interfaces that a class supports... pairing an interface ID (IID) with the vtable 416 that implement the interface, a vtable 415 is an array pointers to the functions that implement the interface, col 3, ln 35-45/ Fig. 4).

5. It would have been obvious to one of the ordinary skill in the art at the time the invention was made to combine the teaching of Jones and Jordan because Jordan’s interface and vtable as interface vtable, the second pointer of an object configured to point to the interface vtable associated with the interface would provide an interface list with information about which interfaces are supported on each class and relieve individual designers to device complicated schemes to reduce memory consumption.

Jones and Jordan do not explicit teaches allowing for efficient casting of references of an interface type into references whose type is defined by the class configured to implement the interface. However, Boujarwah teaches allowing for efficient casting of references of an interface type into references whose type is defined by the class configured to implement the

interface (a reference to an interface type can be cast to the class type if the reference actually refers to an instances of the specified class or any its subclasses, page 8, ln 35-40).

It would have been obvious to one of the ordinary skill in the art at the time the invention was made to combine the teaching of Jones, Jordan and Boujarwah because Boujarwah's allowing for efficient casting of references of an interface type into references whose type is defined by the class configured to implement the interface would handle type safe casting between polymorphic classes of an object via pointers or references.

6. **As to claim 7**, Jordan teaches interface vtable is indexed by the name of the function (an pairing interface ID with the Vtable 416, col 3, ln 33-67/ Fig. 4).

8. **As to claim 8**, it is and apparatus claim of claim 1; therefore, it is rejected for the same reason as claim 1 above. In additional, Jones teaches invoke a function (invoking the function member, col 20, ln 1-34).

9. Jones does not teach the term a request. However, Jordan teach request (a request/call, col 5, ln 45-67).

10. It would have been obvious to one of the ordinary skill in the art at the time the invention was made to combine the teaching of Jones and Jordan because Jordan's call would invoke the member function of an object to implement an interface.

11. **As to claim 10**, it is apparatus claim of claim 8; therefore, it is rejected for the same reason as claim 8 above.

12. Claims 2, 3, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al (US. Patent 5,754,862) in view of Jordan (US. Patent 6,016,392) in view of Boujarwah (Testing

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syntax and semantic coverage of Java language compilers) as applied to claim 1 above and further in view of AP (Arrays, pointers, pointer arithmetic).

13. **As to claim 2**, Jones, Jordan and Boujarwah do not teach a third pointer points to a canonical base address. However, AP teaches a third pointer points to a canonical base address (the new pointer point to X [1], sec 7.3, page 1-3).

14. It would have been obvious to one of the ordinary skill in the art at the time the invention was made to combine the teaching of Jones, Jordan, Boujawah and AP because AP's the new pointer point to X [1] would allocate the specified number of contiguous cells of the indicated type.

15. **As to claim 3**, AP teaches the pointer is located at a predefined offset from the second pointer, and adjacent to the second pointer (the new pointer equals the original value of the pointer by increased by the size of type involved (sec: 7.3, page 1).

16. **As to claim 4**, AP teaches the third pointer is adjacent to the second pointer (the third pointer is adjacent to the second pointer teaches X+0, X+1 pointer, sec 7.3, page 1-3).

17. Claims 5,6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al (US. Patent 5,754,862) in view of Jordan (US. Patent 6,016,392) in view of Boujarwah (Testing syntax and semantic coverage of Java language compilers) as applied to claim 1 above and further in view of Kathleen Fisher et al (What is an Object – Oriented Programming Language?)

18. As to claim 5, Jones, Jordan and Boujarwah do not explicit teach the term a class vtable, fourth pointer (&(B3:Fa11, Fig. 14). However, Kathleen teaches a class vtable, fourth pointer (class's Vtable, the A vtable contains pointers to the methods, sec: 2.3, page 7/ Fig. 1/ Fig. 2).

19. It would have been obvious to one of the ordinary skill in the art at the time the invention was made to combine the teaching of Jones, Jordan, Boujarwah and Kathleen because Kathleen's class's Vtable, the A vtable contains pointers to the methods would reduce the cost of method lookup to a simple indirection without search by an ordinary function call.

20. As to claim 6, Jones teaches vtable is indexed by the name of function (the virtual function name af11, col 14, ln 1-55, Fig. 10).

21. Claims 9, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al (US. Patent 5,754,862) in view of Jordan (US. Patent 6,016,392) in view of Boujarwah (Testing syntax and semantic coverage of Java language compilers) as applied to claim 1 above and further in view of Danel Liang (Java programming).

22. As to claim 9, Jones, Jordan and Boujarwah do not explicit teach an argument. However, Liang teaches an argument (an argument page 118, sec: passing objects to methods).

23. It would have been obvious to one of the ordinary skill in the art at the time the invention was made to combine the teaching of Jones, Jordan, Boujarwah and Liang because Liang's an argument would provide great flexible, modularity and reusability for developing software.

24. As to claim 11, it is an apparatus claim of claim 9; therefore, it is rejected for the same reason as claim 9 above.

25. Claims 12, 13, 15, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over TO (Object Reference casting) in view in view of AP (Arrays, pointers, pointer arithmetic) and further in view of Boujarwah (Testing syntax and semantic coverage of Java language compilers).

26. As to claim 12, TO teach a first reference (reference, page 2, ln 26-50), an object (object, page 2, ln 26-50), a type (M1, page 2, ln 26-50), an interface (an interface, ln 26-50), a request to cast (cast, page 2, ln 26-50), a type defined by a class (class type, page 2, ln 26-50).

27. TO do not teach a pointer contained in the object, the pointer configured to point to a canonical base address of object. However, AP teaches a pointer contained in the object, the pointer configured to point to a canonical base address of object (the new pointer point to X [1], sec 7.3, page 1-3).

28. It would have been obvious to one of the ordinary skill in the art at the time the invention was made to combine the teaching of TO and AP because AP's the new pointer point to X [1] would allocate the specified number of contiguous cells of the indicated type.

TO and AP do not explicit teach the pointer allowing for efficient casting of the first reference. However, However, Boujarwah teaches the pointer allowing for efficient casting the first reference (a reference to an interface type can be cast to the class type if the reference actually refers to an instances of the specified class or any its subclasses, page 8, ln 35-40).

It would have been obvious to one of the ordinary skill in the art at the time the invention was made to combine the teaching of TO, AP and Boujarwah because Boujarwah's allowing for

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efficient casting of references of an interface type into references whose type is defined by the class configured to implement the interface would handle type safe casting between polymorphic classes of an object via pointers or references.

29. As to claim 13, AP teaches the pointer is located at a predefined offset from the second pointer, and adjacent to the second pointer (the new pointer equals to $X[1]$, sec 7.3, page 1-3).

30. As to claims 15, 16, they are apparatus claims of claims 12, 13; therefore, they are rejected for the same reasons as claims 12, 13 above.

31. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over TO (Object Reference casting) in view in view of AP (Arrays, pointers, pointer arithmetic) in view of Boujarwah (Testing syntax and semantic coverage of Java language compilers) as applied to claim 12 above and further in view of Gartner et al (US. Patent 6,421,681 B1).

32. As to claim 14, TO, AP and Boujarwah do not teach return the type defined by casting. However, Gartner teaches return the type defined by casting (return ... cast to object, col 18, line 1-20).

33. It would have been obvious to one of the ordinary skill in the art at time the invention was made to combine the teaching of apply the teaching of TO, AP, Boujarwah and Gartner because Gartner's return ... cast to object would make method for dispatch of interface calls more consistent.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to LeChi Truong whose telephone number is (703) 305 5312. The examiner can normally be reached on 8 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on 703-305-9678. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIP. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIP system, contact the Electronic Business Center (EBC) at 866-217-9197(toll-free).

LeChi Truong

February 28, 2005


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